

## Lesson no. 18 Gum of trees.



There are many types of tree gums in nature but 3 gum tree are mentioned in Tibb e Nabawi guggul, Mar, Loban which I am going to explain separately in this lesson, first we will learn about guggul.

- **Guggul:-**

The guggul plant is widely distributed throughout India and adjacent dry regions. The tree is a small shrub with thorny branches. The gum, called "guggul" or "gum guggulu," is tapped from the stem of the plant, and the fragrant yellow latex solidifies as it oozes out. Excessive production of the gum eventually kills the plant. This plant gum has been used in traditional Ayurvedic medicine for centuries in the treatment of a variety of disorders, most notably arthritis, and as a weight-reducing agent in obesity. In Hadith guggul is called by the name Kandar & there are 2 Hadith regarding it in At-Tibb Al-Nabawi (Al-Jawzi) volume no. 1 page 294 it is a book on Tibb e nabawi; please visit my website [www.tib-e-nabi-for-you.com](http://www.tib-e-nabi-for-you.com) for detail Islamic study on guggul or read lesson no. 65 in part 2 of my English book Tibb e Nabawi page 231; it is advised to use it soaked in little water for weak memory & urinary problem; sugar can be add in this water. For detail please go through the Hadith in my book; direct link to lesson guggul on my website is <http://www.tib-e-nabi-for-you.com/guggul.html>

Commiphora mukul & Commiphora wightii both a little different from each other but come under same heading & release gum of same kind.

- **NAMES:-**

1. In Hadis it is called as Kandar (الكندر)
2. In Sanskrit it is called as Guggulu.
3. In Latin it is called as Commiphora Mukul & Commiphora wightii.
4. In Hindi it is called as Guggul
5. In English it is called as Indian Bdellium tree.
6. Its family is Burseraceae
7. In Urdu its gum is commonly called as Gond.

- **Guggul tree:-**

Commiphora wightii is a flowering plant in the family Burseraceae; which produces a fragrant resin called gugal, guggul or gugul that is used in incense and Vedic medicine (or ayurveda). The guggul plant may be found from northern Africa to central Asia, but is most common in northern India. It prefers arid and semi-arid climates and is tolerant of poor soil. It grows as a shrub or small tree, reaching a maximum height of 4 m (13 ft), with thin papery bark. The branches are thorny. It is sought for its gummy resin, which is harvested from the plant's bark through the process of tapping. The resin, which flows out, is allowed to harden before it is collected. The tree is tapped from November to January and the resin is collected through May to June. A guggul tree yields between 250 to 500 g of dry resin during each collection season. It is gynodioecious, with some plants bearing bisexual and male flowers, and others with female flowers.

- **Leaves:-**

The leaves are simple or trifoliate, the leaflets ovate, 1–5 cm (0.39–1.97 in) long, 0.5–2.5 cm (0.20–0.98 in) broad, and irregularly toothed.



- **Flower: -**



The individual flowers are red to pink, with four or five small petals. It is gynodioecious, with some plants bearing bisexual and male flowers, and others with female flowers.

- **Fruit: -**





The small round fruit are red when ripe; oval in shape and pulpy in nature.

- **Guggul gum: -**



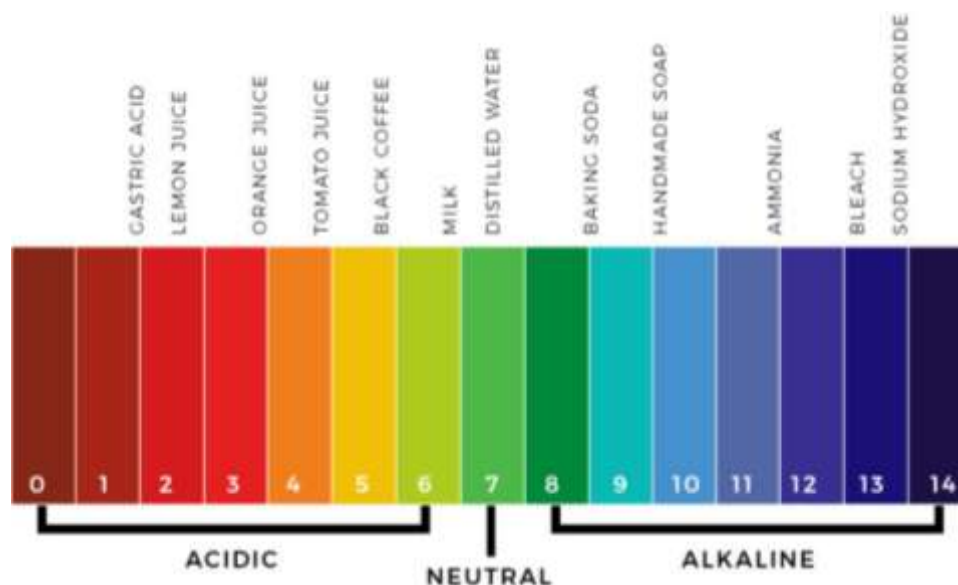
It is also called as Guggulipid or guggul resin; guggul is a fragrant resin produced by secreted by the Commiphora mukul or Commiphora wightii; Guggul resin is tapped from the tree in much the same way as maple syrup. Harvesting may begin as early as November and continue until late July. The collected resin is then hand-picked to remove foreign matter and allowed to dry, once it has been graded for purity, guggul can be used for incense or to make medicinal extracts, powders, and topical salves. Because of its bitter taste, guggul is seldom used to make tea. It has many compounds that have lot of health benefit which we will discuss in this lesson further. Its gum has to purify before used. Guggulu occurs in vermicular pieces of pale yellow or brown coloured mass with aromatic odour and bitter astringent taste; when fresh it is viscid and golden coloured.

- **pH of guggul gum is: -** The pH value of 1% w/v aqueous solution and 10 % w/v aqueous solution of raw guggul was 6.44; it is mild acidic because its pH is little less than 7.

pH is a measure of hydrogen ion concentration, a measure of the acidity or alkalinity of a solution. The pH scale usually ranges from 0 to 14. Aqueous solutions at 25°C with a pH less than 7 are acidic, while those with a pH greater than 7 are basic or alkaline & 7 is neutral; only aqueous solutions have pH levels, vegetable oil has no pH value. Likewise, other oils such as animal and petrochemical oils also have no pH value. Fatty acids are organic molecules often found in foods, including vegetable oils.

The pH of pure water is 7. In general, water with a pH lower than 7 is considered acidic, and with a pH greater than 7 is considered alkaline. The normal range for pH in surface water systems is 6.5 to 8.5, and the pH range for groundwater systems is between 6 and 8.5. We can add normal water to reduce the acidity.

It is Sunnat of Prophet Muhammed (s.a.w) to mixe acidic with Alkaline to make it neutral or less acidic that why He use eat dates with watermelon or cucumber or dry dates with little butter; so you can mix one acidic with alkaline; also it is Sunnat to drink honey mixed in water; also dates or raisins soaked in water over night & drink the syrup (sharbat). Remember do not soak dates & raisin together at one time; soak at separate time & drink. Even in Hadith it is mentioned to use it soaked in water.



- **Calories of guggul gum:** - it has very less calories but yet not fully known.
- **Glycemic index & Glycemic load of guggul gum:** - it is helpful in diabetes, but its glycemic index & load are not known yet.

A food is considered to have a low Glycemic index (GI) if it is 55 or less; mid-range GI if 56 to 69 & high GI if 70 or more. *Glycemic index* is a number. It gives you an idea about how fast your body converts the carbs in a food into glucose.

A low Glycemic load (GL) is between 1 and 10; a moderate GL is 11 to 19; and a high GL is 20 or higher. For those with diabetes, you want your diet to have GL values as low as possible.

The *glycemic load* (GL) of food is a number that estimates how much the food will raise a person's blood glucose level after eating it. *Glycemic load* accounts for how much carbohydrate is in the food and how much each gram of carbohydrate in the food raises blood glucose levels.

- **Gross health benefits of qugul gum:** -

C. mukul has been used as an anti-inflammatory, antispasmodic, anti-suppurative, thyroid-stimulant, nervous diseases, cardiovascular diseases, anthelmintic, depurative, skin disorders, leprosy, pyorrhea, muscle spasms, hypertension, urinary disorders, vulnerary, antiseptic, demulcent, aphrodisiac stimulant, liver tonic, anti-arthritic, anti-inflammatory, antibacterial and antifungal activity, antioxidant, good for heart & brain diseases, anti-obesity, anti-lipid, anticancer etc.

- **Clinical pharmacology of guggul:** -

1. The steroids present in guggul reduces lipid in blood were and are anti-inflammatory.
2. Commiphora wightii ethanol extract of trunk is anti-fungal;
3. Flavone known as Muscanone along with old known compound known as naringenin is active against *Candida albicans* (fungus).
4. E-Guggulsterone and Z-Guggulsterone has the property of lowering blood lipid. Naringenin prevents the accumulation of lipoproteins and also acts as anti-bacterial, anti-inflammatory, anti-viral.
5. Cembranoids controls the gastrointestinal absorption of cholesterol.
6. Myrrhanol (a triterpenoid) in guggul gum acts as anti-inflammatory and also used to reduce pain in osteoarthritis.
7. Alpha pinene acts as anti-fungal and also anti-microbial.
8. Eugenol (mono terpenoid) has the anti-oxidant property and it also plays a vital role in the cell proliferation in tumors. It also acts as anti-microbial.
9. Mansumbinoic acid also acts as anti-inflammatory and anti-bacterial. Also Alpha terpineol is a strong anti-microbial. .
10. Beta sitosterol inhibits the cholesterol in the body and reduces the level of cholesterol.

11. 1,8-cineole acts as anti-inflammatory and antinociceptive agent.
12. Quercetin has the most effective anticancer activity.
13. Diayangambin has the immunomodulatory and anti-inflammatory activity and also used to reduce the ear swelling.
14. Ellagic acid has the anti-mutagen, anti-inflammatory and anti-cancer activity. It binds with cancer cells and makes them inactive.
15. L-Arabinose is a good for sugar.
16. Guggul tetrols are present in guggul. In this article it is clearly concluded that guggul means protection against many diseases.
17. Beta sitosterol, Eugenol shows the high medicinal properties like anti-inflammatory, hypo-lipidemic, anti-cancer.

- **Modern uses of it: -**

1. **For urinary problems & weak memory: -**

Take 1 teaspoon of dried pure clean guggul gum powder or granules & 1 teaspoon of honey soak it in 1 cup water over night & drink the water on empty stomach let the guggul granules be in the cup & add half teaspoon guggul more & 1 cup water & let it soak till evening & drink it at night but eat the dinner light & sooner. Repeat this till 3 days morning & evening & on 4<sup>th</sup> day discard all guggul & take new guggul & repeat of 3 days. Continue for 40 days followed by alternative 40 days followed once a week for 1 year.

2. **For arthritis: -**

Take half teaspoon of dried pure clean guggul gum powder or granules & soak it in 1 cup milk for 3 hours & boil it on flow flame & add half teaspoon of pure turmeric powder (haldi) in that milk & drink it on empty stomach daily for 40 days followed by twice a week for lifelong.

3. **For General health: -**

Take half teaspoon of dried pure clean guggul gum powder soak it 3 teaspoon of extra virgin olive oil over night, in the morning mixe both evenly & add 1 spoon of pure honey mix the paste evenly & lick it empty stomach early morning, after licking drink 12 cup water, repeat this once or twice a week.

4. **To prevent diseases: -**

Take half teaspoon of dried pure clean guggul gum powder & 1 teaspoon of pure marjoram leaves dried granules & add 2 cups water boil it & prepare a tea & drink it once or twice a week lifelong.

- **Active ingredient of guggul gum: -**

The active ingredients in gugulipid are the ketosteroids cis- and trans-4, 17 (20)-pregnadiene-3, 16-dione, also known as E- and Z guggulsterone are extracted from the resin that is safer and more effective than many cholesterol lowering drugs.

- **Contents/constituents of guggul gum: -**

All contents may not present in all types of it, because there are many varieties of it according to geographical regions & content may differ a lot as per cultivation, soil, seed, climate etc.

Guggulu contains diterpenoids, triterpenoids, steroids, long-chain aliphatic tetrols, aliphatic esters, ferulates, lignans, carbohydrates, and a variety of inorganic ions besides minor amounts of sesamin, amino acids, and different inorganic compounds.

E-Guggulsterone, Z-Guggulsterone, Guggulsterol-I, Guggulsterol-II, Guggulsterol-III, Guggulsterol-IV and Guggulsterol-V, mukulol, Guggul-tetrols, Octadecane-1,2,3, 4-tetrol, non adecan-1,2,3, guggullignan I, guggullignan II, ferulic acid, Alphapinene, Methyl chavicol, cineole (eucalyptol), myrcene, dimyrcene, polymyrcene, eugenol, d-limonene, linalool,  $\alpha$ -terpineol, d- $\alpha$ -phellandrene, methylheptanone, bornyl acetate, geraniol, cembrene, cembrene-A, allylcembrol, 4-epiisocembrol, myrrhanol A, myrrhanone B, commipherol, commipherin, octanordammarane triperpenoid, epimansumbinol, mansumbinoic acid.

- **A good quality of guggul gum contains little amount of amino acids mentioned in table below:**

Cystine, histidine, lysine, arginine, aspartic acid, serine, glutamic acid, threonine, alanine, proline, tyrosine, tryptophan, valine, leucine, and isoleucine.

The above ingredients are based on scientific study, means these has been indentified, known & learnt by modern science, it does not means that it contains only these ingredients, there may be many more ingredients which are yet to be discovered, learnt & known by modern science. The details of content are jointly mentioned at the last part of the lesson; it is written jointly means Guggul, myrrh & benzoic together. Hereby we start with myrrh lesson after myrrh lesson, benzoic (lobaan) lesson continues.

### Gum Myrrh



Gum Myrrh is a natural gum or resin extracted from a small, thorny tree species of the genus *Commiphora*. Myrrh resin has been used throughout history as a perfume, incense, and medicine. Myrrh mixed with wine was common across ancient cultures, for general pleasure and as an analgesic. When a wound on a tree penetrates through the bark and into the sapwood, the tree secretes a resin. Myrrh gum, like frankincense, is such a resin. Myrrh is harvested by repeatedly wounding the trees to bleed the gum, which is waxy and coagulates quickly. After the harvest, the gum becomes hard and glossy. The gum is yellowish and may be either clear or opaque. It darkens deeply as it ages, and white streaks emerge. Please visit my website [www.tib-e-nabi-for-you.com](http://www.tib-e-nabi-for-you.com) for detail Islamic study on Myrrh or please read lesson no. 66 in my English Tibb e Nabawi part 2 page 234. It is mentioned in book of Hadith Shobul Imaan : 5679 in this Hadith it is advised to fumigate the houses with Al-Sheeh (الشيح) , Mur (المر), & Sau'atar (الصعتر) (saatar).

Al-Sheeh (الشيح) according to many scholars is dried leaves of Cress (refer Lesson no. 20 Cress in part 2) Sau'atar (الصعتر) (saatar) is thymes (refer Lesson no. 31 Sau'atar (الصعتر) in part 2. Please visit my website <http://www.tib-e-nabi-for-you.com/mur.html> direct link to lesson on myrrh; or read my English book Tibb e Nabawi page no. 234 in part 2.

#### • NAMES:-

1. In Hadees & Arabic it is called as Mur (المر)
2. In Hindi it is called as Bol, Bolam, Hirabol, Polam.
3. In Sanskrit it is called as Gars Gandha.
4. In Latin it is called as Commiphora myrrh
5. In English it is called as Mor.
6. Its tree is from Burseraceae family.

#### • Myrrh tree: -





It is a deciduous thorny tree with hairless toothed leaves, there many type trees belonging in this family; Commiphora myrrh is very spiny and it grows to a height of about 4 to 5 m (13 ft) in height & 1.5 m wide. It grows at an altitude of between about 250 to 1,300 m (820 to 4,270 ft) with a yearly mean rainfall of about 23 to 30 cm (9.1 to 11.8 in). It does best in thin soil, primarily in areas with limestone. Myrrh resin which is strongly aromatic oozes from natural cracks. Its tree is from Burseraceae family; it is one of the primary trees used in the production of myrrh, a resin made from dried tree sap. The tree is native to the Arabian peninsula (Oman, Yemen) and to Africa (Djibouti, Ethiopia, Somalia, Northeast Kenya); the bark has a silvery luster and peels off in small pieces; it is called 'mur' (المُر) in Arabic, the word means bitter, it is a gum of a myrrh tree and the gum shares the same name.

- **Leaves, fruit & flowers: -**



The leaves are oblong to oval and have 3 leaflets per leaf; each leaflet is about 1 cm long; leaves are large terminal leaflet and two tiny lateral leaflets. The four-petal flowers are yellow-red and narrowly oval. It is drought and frost-tolerant. It is propagated by seeds or cuttings. It is otherwise known as Dheddin. The bark yields a fragrant resin used as flavouring fir sweets, baked goods, beverages, chewing gum, and desserts. Male flowers are about 5 mm long and come out just before the rains; fruits are about 1.2 cm long. Its oil is very famous & called Oleoresin. It is very famous from Mecca, so it is called 'Mur Makki'.

- **Myrrh gum: -**



In pharmacy, myrrh gum is used as an antiseptic in mouthwashes, gargles, and toothpastes. It is also used in some liniments and healing salves that may be applied to abrasions and other minor skin ailments. It is used as an analgesic for toothaches and can be used in liniment for bruises, aches, and sprains, common ingredient of tooth powders. It is commonly claimed to remedy indigestion, ulcers, colds, cough, asthma, lung congestion, arthritis pain, and cancer. In book of Hadith Shobul Imaan: 5679 it is mentioned that Messenger of Allah Muhammad (s.a.w) stated, 'Fumigate your houses with al-shih, murr, and sa'tar. The word "murr" refers specifically to Commiphora myrrh. The other two are Al-Shih (possibly cress) and Sa'tar (or *Za'atar* - thyme). It is very famous from Mecca, so it is called 'Mur Makki'. It is anti bacterial, anti fungal, anti pest and can be used for fumigation or oral uses. It has been used as an astringent, antiseptic, anti parasitic, anti tissive, emmenagogue, and antispasmodic agent. It was commonly included in mixtures used to treat worms, wounds, and sepsis. In Hadees it is mentioned to fumigate with it & it has been found that it is very helpful in fumigation. It is little soluble in water.

- **Myrrh oil: -**

Myrrh oil has a warm, slightly musty smell and is pale yellow to amber in color. Myrrh oil is extracted by steam distillation of the oleoresin-gum (crude myrrh) and yields 3 - 5 %.

pH, calories, glycemic index & glycemic load are not known yet because it is used in very little dose.

- **Gross health benefits of myrrh oil: -**

Myrrh oil is non-irritant and non-sensitizing, but could be toxic in high dosage and should not be used in pregnancy, as it can act as a uterine stimulant. The therapeutic properties of myrrh oil are anti-catarrhal, anti-inflammatory, antimicrobial, anti-phlogistic, antiseptic, astringent, balsamic, carminative, cicatrisant, emmenagogue, expectorant, fungicidal, sedative, digestive and pulmonary stimulant, stomachic, tonic, uterine and vulnerary. Myrrh oil is of great benefit to the respiratory tract, the digestive system, for gum and mouth disorders, in skin care, as well as urino-genital and gynecological problems.

- **Gross health benefits of myrrh gum: -**

It is antioxidant, anticancer, anti-pain, anti bacterial, anti fungal, anti pest and can be used for fumigation or oral uses. It has been used as an astringent, antiseptic, anti parasitic, anti tissive, emmenagogue, and antispasmodic agent. It was commonly included in mixtures used to treat worms, wounds, and sepsis. In Hadees it is mentioned to fumigate with it & it has been found that it is very helpful in fumigation.

- **Clinical pharmacology of myrrh gum & oil: -**

Myrrh reduces the production of cytokines and reduces the effects of inflammation. It is also suggested to produce an analgesic effect. Myrrh produces cell damage and death in various cancer cell types. Myrrh has been observed to exert an antibacterial, anti-parasitic, and antifungal activities. Myrrh reduces liver injury in response to carbon tetrachloride insult, suggesting hepato-protective action. It also displays antioxidant properties. Myrrh reduces low density lipoprotein levels. Myrrh appears to be cardio-protective, producing a decrease in heart rate and restoring blood pressure in response to isoproterenol challenge. Myrrh lowers plasma glucose and insulin levels in type 2 diabetes mellitus models suggesting an improvement in insulin sensitivity. Myrrh has been observed to protect against both substance and stress induced gastric lesions.

**Hepatoprotective:** Myrrh has been shown to reduce liver injury and up-regulation of superoxide dismutase, glutathione peroxidase and catalase in response to carbon tetrachloride insult. This is thought to be due to anti-oxidant properties of myrrh.

**Anticancer:** Myrrh displays a pro-apoptotic effect on cancer cells.

**Curzerene** is a sesquiterpenoid known to possess antioxidant and free radical neutralizing properties. It plays a significant role against oxidative damage-associated diseases; other diverse biological activities which sesquiterpenoids possess include antibacterial, antifungal, and anesthetic.

Anti-inflammatory activities of Commiphora myrrh extract has also been reported which indicate toward the probable role of compounds present in myrrh resin as well.

**Limonene**, a monoterpene was also detected in myrrh resin, which is a very well-studied terpene. It is already in clinical practice for the treatment of cholesterol containing gall stones and gastroesophageal reflux disease (GERD). Limonene has very well reported chemo-preventive properties against many types of cancer.

Reactive oxygen species (ROS) are very well known to cause oxidative damages to the cellular macromolecules including lipids, nucleic acids and proteins. These kinds of biological insults may result into cell death and disease progression. The essential oil of C. myrrh demonstrated potent superoxide anion radical scavenging activity. And more you read in separately explained contents below.

- **Modern uses of myrrh oil: -**

**Burners and vaporizers: -**



In vapor therapy, myrrh oil can be useful with bronchitis, catarrh, colds and coughs. It is also great for enhancing spirituality and is most useful when meditating; means add myrrh oil in warm water.

**Blended massage oil or in the bath: -**

In a blended massage oil or diluted in the bath, myrrh oil is great for bronchitis, catarrh, colds, coughs and infections, as well as the variety of female problems listed above. It also has a wonderful effect on the skin; add few drops of myrrh oil in bath water or massage oil.

**Mouthwash: -**

It can be included when mixing a mouthwash for all dental infections; its oil can mixed in warm water for gargling; can be used alone or with other herbs.

**Cold compress: -**

Add few drops of myrrh oil diluted in cold water for cold compress for sores, skin care and wounds.

**Cream or lotion: -**

Add few drop of its oil in a cream or lotion, amazing results are achieved in the treatment of chronic wounds and ulcers. It accelerates wound healing and sorts out athlete's foot, as well as weeping eczema. Bedsores, deeply chapped and cracked skin, boils, carbuncles, acne and all other skin ailments show dramatic results when myrrh oil is used to treat them, and it can also be applied with a cotton bud directly on sores, wounds and other skin infections.

- **Modern uses of myrrh gum: -**

1. **For general health & in all disease: -**

Take 1 teaspoon of dried myrrh & guggul gum each powder or granules, soak in little water over night & add 1 spoon honey stir & drink the water on empty stomach early morning, 2 or 3 times a week, you can even boil it mildly & add honey after boiling & serve.

2. **For cough & cold: -**

Take 1 teaspoon of dried myrrh & guggul gum each powder or granules & 1 teaspoon of dried marjoram leaves, flower etc & add these in 2 cups of water boil on mild flame to prepare tea & serve twice a day till complete relief.

- **Contents/constituents of myrrh gum: -**

All contents may not present in all types of it, because there are many varieties of it according to geographical regions & content may differ a lot as per cultivation, soil, seed, climate etc.

α-pinene, dipentene, limonene, cuminaldehyde, cinnamic, aldehyde, eugenol, m-cresol, heerabolene, cadinene, formic acid, acetic acid, myrrholic acid, palmitic acid, isolinalyl acetate, epi-lupe-nyl acetate, lupeone, 3-epi-α-amirin, α-amirone, acetyl β-eudesmol, sesquiterpenoid lactone, commiphoric acid, heeraboresene, heerabomyrrhols, commipherin, benzoates, mamates, potassium, formic acid, acetic acid, tanin, Arabinose, galactose, glycuronic acid, pyrocatechin, protocatechin etc.

- **Contents/constituents of myrrh oil: -**

Curzerene, fura-noeudesma, diene, furanodien, lindestrene, curzerenone, furanodien-dihydropyrocurzerenone, methoxy-hydrofuranodien, methoxyfuranoguaia, heerabolene, cuminaldehyde, myrcene, camphorene, z-gugulsrterol I, II, III, gugglustreterol, α-pinene, cadinene, limonene, eugenol, m-cresol, acetic acid, formic acid.

- **Active ingredient of myrrh oil: -**

The main chemical components of myrrh oil are α-pinene, cadinene, limonene, cuminaldehyde, eugenol, m-cresol, heerabolene, acetic acid, formic acid and other sesquiterpenes and acids.

- **Active ingredient of myrrh gum: -**

Arabinose, galactose, glycuronic acid, pyrocatechin, protocatechin, commiphoric acid, eugenol, cuminaldehyde.

There separate explanation of each contents of myrrh, guggul & benzoin are mentioned jointly at the last part of the lesson after benzoin (lobaan) lesson. We start will benzoin lesson.

## **Benzoin (Lobaan)**



Benzoin is sometimes called gum benzoin or gum Benjamin and in India as Sambrani or lobaan, though loban is, via Arabic lubān, a generic term for frankincense-type incense, e.g., fragrant tree resin. Benzoin is also called storax, not to be confused with the balsam of the same name obtained from the Hamamelidaceae family.

There are two common kinds of benzoin, benzoin Siam and benzoin Sumatra. Benzoin Siam is obtained from *Styrax tonkinensis* & Benzoin Sumatra is obtained from *Styrax benzoin*, lobaan is the best energy purifier of Atmosphere. Using of Loban has spiritual and customary secret in India to elevate the energy level. From the times of Saints and Kings Loban are been used for fulfilling the rights and rituals. Sambrani is frequently used in religious ceremonies and is measured to have a great impact on cleansing and releasing the human body energy centers/ meridians. It is pure, clean and pleasing for cleansing weather you wish to clear a room or simply for cleaning your atmosphere. A study states that Loban helps in uplifting the inspiration and creativity. Benzoin can help attract love, provide psychic protection, wisdom, aids the memory, and helps ease depression.

It is mentioned in book of Hadith Shoabul Imaan : 5697 & Zaadul Maad page 387. In Hadith it is mentioned that Nabi (s.a.w) said to fumigate the house with Lobaan & Saautar (thyme) & in next Hadith fumigate the house with Lobaan & Ash-Sheeh (cress) or red my English book Tibb e Nabawi page no. 229 in part 2.

- **NAMES:-**

1. In Hadees it is called as Loban (اللبان)
2. In Latin & botanically, it is called as *Styrax benzoin*/*Styrax tonkinensis*.
3. In Sanskrit it is called as Loban
4. In English it is called as Benzoin.
5. In Marathi it is called as Uud.
6. In Hindi & Urdu it is called as Loban.

- **Styrax benzoin tree: -**



*Styrax benzoin* (benzoin resin) is a perennial tree of tropical area; belonging to the family (Styracaceae). It has been cultivated in the different regions of the world for thousands of year for incense and

pharmaceutical preparations. *Styrax benzoin* usually contains benzaldehyde, benzoic acid, benzyl benzoate cinnamic acid and vanillin. Its chemical composition is influenced by the place of its origin, geographical, and climatic conditions. *Styrax benzoin* has been used traditionally for the treatment of skin diseases, arthritis, wounds, muscle pain, anxiety, and nervous disorders. Benzoin oil is widely used in the food, drinks and alcoholic beverage to give flavor, and for varnishing woods. The methods of production of resins are much traditional so there is a growing need to develop the new methods to maximize the production of resins. Benzoin is an aromatic, evergreen tree growing from 8 - 34 meters tall with a slightly buttressed bole that can be from 10 – 100 cm in diameter. The plant excretes a fragrant balsam on being bruised. This species is the main source of the fragrant gum, benzoin. It grows in areas where the mean annual rainfall is usually 1,500 - 2,200 mm, with no distinct dry season. It has tap root which spreads laterally but has a shallow root system.

Please visit my website [www.tib-e-nabi-for-you.com](http://www.tib-e-nabi-for-you.com) for detail Islamic study on benzoin or read my English book *Tibb e Nabawi* part 2, lesson no. 64 page 229. It is mentioned in book *Hadith Shobul Imaan* : 5679 & *Zaadul Maad* page no. 387; in Hadith it is mentioned to fumigate the house with Loban (اللبان) & Al-Sheeh” (الشَّيْح) (cress).

Direct link to lesson benzoin (lobaan) is <http://www.tib-e-nabi-for-you.com/loban.html>

- **Leaves: -**



Leaves are ovate, arranged alternately in the form of crown around the stem with hairy underside & smooth upper surface, leaves length in the range of 6-10 cm & 3-5 cm wide. 1

- **Flower: -**



The flowers are bisexual, white in colour, bell shaped in the time of blooms in a spring & has 5 petal which are pendulously arranged in the form of cluster along the branches., with a white 5–10-lobed corolla, produced 3–30 together on open or dense panicles 5–25 cm long.

- **Fruit: -**





The fruit is an oblong dry drupe, smooth and lacking ribs or narrow wings, unlike the fruit of the related snowdrop trees (Halesia) and epaulette trees. Fruits are closed in the hard & flat shell having the diameter 2-3 cm. Seeds dormant after 6-7 months of fruit fall.

- **Gum:-**



The gum comes out from incision given on the bark of its tree; Benzoin gum contains variable quantities of cinnamic, benzoic and sumaresinolinic acid esters; free acids such as benzoic acid; benzaldehyde and vanillin. The gum is strongly antiseptic, carminative, expectorant and astringent. Taken internally, the gum acts to settle griping pains, to stimulate coughing and to disinfect the urinary tract. It is used in the treatment of coughs, colds, bronchitis, sore throats. The gum of various colour grey, black, brown, mixe. Styrax Benzoin possesses a sweet, warming, rich, vanilla-like aroma with resinous undertones. It blends well with other resinous oils like Frankincense or Myrrh. It also blends well with wood oils like Sandalwood and Cedarwood. The tree produces resin (gum) after 15-20 years. It is acrid, impressively aromatic & has strong vanilla like smell due to vanillin compound present in it.

Styrax benzoin resins are obtained by tapping of the trees. In order to obtain the resins in the form of tears having 5-6 cm length and 8-10 cm wide notches are made on the cambium of trunk and bark of tree is removed. The tapper makes a notch of 8-10 cm wide and 5-6 cm long into the cambium of the trunk and the bark is removed. Along the trunk of tree a number of notches are made after the interval of 20 to 30 cm and the first notch is made at a length of 30 cm above the ground level. After tapping exuded resins are lifted on the trunk of tree after approximately 4 to 5 months for hardening the resins. The process of tapping occurs during the first cold day of the winter and benzoin tear is obtained. In natural forests, first tapping of benzoin tree is done in the age of 3-5 years while in the regenerated forests tapping is done in the age of 6 to 8 years. After the collection of resins, sorting and hard cleaning is carried out for the removal of bark pieces but extra care is required to retain the whole tear as such.

pH, calories, glycemic index & glycemic load is not known because it is used mostly in fumigation & rarely used orally in very minor dose that also in combination of other herbs.

- **Gross health benefits of benzoin (lobaan) gum: -**

Benzoin is also used as a preservative and fragrance compound in the perfumes, soaps, cosmetics and toiletries. Benzoin is also used as a flavouring agent in the food, alcoholic beverage and soft drinks. Benzoin resins act as powerful antioxidants and help to prevent the rancidity of fats. Styrax benzoin is also used in the healing of wounds. Styrax benzoin is used as disinfectant and it is a good herbal remedy for the throat infection and for respiratory elements. Its tincture is used as a mouthwash for the treatment of cold sores. After the tooth extraction, dentists use benzoin resins tincture as an anti-inflammatory agent. Benzoin resins are familiar in the products which are used in the treatment of skin diseases like irritated or dry skin, wounds and inflamed skin. Benzoin resins are used as herbal remedy for the muscle pain, poor circulation, gout and arthritis. After burning, it produces a sweet smell that uplifts the mood and stimulates the nervous system. It stimulates the heart beat by giving warm feelings and improves the circulation of blood. Oil extracted from the aromatic plant is known as essential oil

which has various pharmacological uses due to the presence of various bioactive components. Benzoin oil is used as sedative and relaxant and relieves the tension, stress, anxiety and nervousness. It brings out the neurotic or nervous system to normal. The compounds like benzoic acid, benzaldehyde and benzyl benzoate which are most effective bactericidal, germicidal, antiviral, fungicidal. If smoke of benzoin resin is spread then smoky zone become free of germs. Benzoin oil also has anti-flatulent and carminative properties.

- **Clinical pharmacology of benzoin (lobaan) gum: -**

Benzoin is used in conditioning of the skin and also to toughen the skin. Benzoin oils are also used for beauty of skin, making the skin fresh and youthful. It also has ability to heal the wounds and scars. Benzoin oil has healing properties that owe to benzoic acid, benzaldehyde and benzyl benzoate. Cinnamate present in the benzoin is also used in toughening of the skin but it is quite toxic and cause allergy.

There are a lot of respiratory problems such as chest infection, pneumonia, asthma, noisy breathing, obstructive sleep apnea and aspiration. Essential oil of benzoin is used to treat congestion, coughing and other respiratory problems. Benzoin is an excellent disinfectant and has expectorant qualities which help free mucus and ease breathing. As well as clearing up the respiratory system, its sedative properties can help clear the way to a good night's sleep. Styra benzoin used in the pharmaceutical industries for the treatment of bronchitis, cough laryngitis and as an antiseptic for prevent the infections.

In digestive issues like cramping and flatulence, then benzoin essential oil might provide relief. This wonderful essential oil has carminative properties as well as being able to relieve gas and inflammation in the intestines. It helps to relax the stomach muscles enabling excess wind to pass naturally, relieves pain related to gas. Benzoin essential oil also improves general digestion and helps improve appetite. One of the health benefits of benzoin oil is preventing the acidity that occurs in the stomach and avoid many diseases are caused by gastric acidity. In cultivated region of Styra benzoin people use it for the ache of stomach.

Diuretic is the disease which commonly characterized as the excess of extracellular fluid, the nephritic syndrome, kidney diseases, heart failure and liver cirrhosis. Benzoin essential oil has natural diuretic properties, which essentially means that it helps to boost both urine production and frequency of urination. Diuretics are used to efficiently cleanse and remove toxins from the blood stream. These properties can have a positive effect on blood pressure and can even help you to lose weight caused by stubborn water retention. Styra benzoin has diuretic properties as it promotes and facilitates the quantity and frequency of urination and through urination; it also helps to remove the toxic substances from the blood. It also helps to reduce weight, improving digestion and lowering of the blood pressure.

- **Modern uses of it benzoin (lobaan) gum: -**

Before using it skin test must be done for allergic reactions means apply some gum on your forearm & wait for 30 minutes or more & watch if reaction occurs that means you are allergic to it & do not use it.

**For wounds, ulcers, sores on skin: -**

Benzoin oil is also used in the treatment of skin diseases by mixing 10 ml of almond oil, 6 drops of benzoin oil and 2 drops of wheat germ oil and by applying on the affected area such as wounds, skin ulceration, burn and bad sores.

**For psoriasis & eczema: -**

Benzoin oil is used for the treatment of psoriasis and eczema with clay as taking 2 tbsp clay and by adding 3 drops of benzoin oil along with distilled water to make paste apply on affected areas and leave it for 20 minutes and then rinse off with water.

**For marks on face: -**

Benzoin is useful with lemon juice for the treatment of brown marks on the face by adding 2 drops of lemon juice, 10 ml almond oil, 4 drops benzoin oil and 2 drops of wheat germ oil.

- **Contents/constituents of benzoin (lobaan) gum: -**

All contents may not present in all types of it, because there are many varieties of it according to geographical regions & content may differ a lot as per cultivation, soil, seed, climate etc.

Styrax benzoin contains cinnamyl cinnamate 8-14 %, methyl cinnamate 10-17 %, cinnamic acid 4-7 %, benzyl cinnamate 2-4 % and little amount of vanillin, benzoic acid 18%, phenylpropylic alcohol, a little amount of volatile acids and 75 % of amorphous resins & esters such as coniferyl and p-coumaryl alcohol are also present, also pinoresinol, coniferyl benzoate, triterpene.

- **Active ingredient of benzoin (lobaan) gum: -**

Its active ingredients are benzaldehyde, benzoic acid, benzyl benzoate, cinnamic acid & vanillin.

- **Contents/constituents of guggul, myrrh & benzoin gum & oil: -**

All contents may not present in all types of it, because there are many varieties of it according to geographical regions & content may differ a lot as per cultivation, soil, seed, climate etc.

A good quality of above gum contains little amount of amino acids mentioned in table below: -

The above ingredients are based on scientific study, means these has been indentified, known & learnt by modern science, it does not means that it contains only these ingredients, there may be many more ingredients which are yet to be discovered, learnt & known by modern science.

The details given below are based on natural ingredients found in above gums and not synthetically prepared.

- **Absorption & digestion of amino acid.**

When we eat high-protein foods, body breaks down protein into amino acids and peptides through digestive enzymes, such as pepsin & pancreas produces trypsin, chymotrypsin and other that aid in protein digestion.

Pepsin is the primary enzyme responsible for digesting protein; it acts on the protein molecules & breaks the bonds – called peptide bonds – that hold the protein molecules together. Next, these smaller chains of amino acids move in the stomach & then in small intestine where they're further broken down by enzymes released by the pancreas. Small intestine contains finger-like extensions called micro-villi. These structures enhance its ability to absorb dietary nutrients. Now the semi digested material pass through brush border and baso-lateral membranes of small intestine & di-tripeptides are absorbed by passive transport (facilitated or simple diffusion) or active transport (Na<sup>+</sup> or H<sup>+</sup> co-transporters) pathways. Di and tripeptides are more efficiently absorbed than free amino acids which in turns are better absorbed than oligopeptides. They're released into the bloodstream and used for various biochemical reactions.

Each amino acid has a different role in the human body. Upon absorption, some amino acids are incorporated into a new protein. Some fuel your muscles and support tissue repair. Others are used as a source of energy.

Tryptophan and tyrosine, for example, promote brain health. These amino acids support the production of neurotransmitters, leading to increased alertness and optimum nerve responses. Tryptophan also assists with serotonin production, lifting your mood and keeping depression at bay.

Phenylalanine serves as a precursor to melatonin, epinephrine, dopamine and other chemicals that regulate your mood and bodily functions. Methionine helps your body absorb selenium and zinc, two minerals that promote overall health. Some amino acids, such as isoleucine, play a vital role in hemoglobin production and glucose metabolism.

- **Tryptophan: -**

It is an amino acids (protein) that is useful in bio-synthesis of protein; it is essential in human because body cannot make it); it is a precursor of neuro-transmitter serotonin, melatonin, vitamin B3; it is a sedative also.

**Main sources of tryptophan: -**



Salmon oil, egg, spinach, milk, seeds, fenugreek seed, soy products, nuts, fish, meat, wheat, banana etc.

**Basic pharmacokinetics of tryptophan (based on human intake in natural food products): -**

It is absorbed in small intestine & reached the blood circulation, it passes the blood brain barrier & in brain cells it is metabolized into indolamine neuro-transmitter, niacin, a common example of indolamine is serotonin derivative from tryptophan. Tryptophan is converted into serotonin in the brain & body; it is believed that tryptophan supplements should be taken with carbidopa, which blocks the blood brain barrier. (Serotonin (5HTP) 5 hydroxytryptamine, is a monoamine neuro-transmitter. It contributes in feelings of well-being, happiness, reward, learning, memory, many physiological functions).

In the pathway of tryptophan/serotonin, melatonin hormone is produced. Melatonin regulates sleep-wake cycle. It is primarily released by pineal gland in brain. It controls circadian (daily clock) rhythms.

Pineal gland releases it at night more & very little in day light. It improves immune system function.

Natural sources of melatonin are tomato, pomegranate, olive, grapes, broccoli, cucumber, barley, seeds, nuts etc.

Fructose malabsorption causes improper absorption of tryptophan in intestine thus leading to low level of it & may cause depression.

**Basic clinical pharmacology of tryptophan: -**

It is necessary for normal growth of infants; nitrogen balance in adults, it aids in sleep pattern, mood. It is necessary for melatonin & serotonin formation in body, it enhances mental & emotional well being, manages pain tolerance, weight etc. it also helps in build muscle tissue, essential for vitamin B3 production, relieves insomnia, reduces anxiety, depression, migraine, OCD, helps immune system, reduces cardiac spasms, improves sleep pattern etc.

- **Threonine: -**

It is an amino acid used in biosynthesis of proteins; it is an essential amino acid important for tooth enamel, collagen, elastin, nervous system, fats metabolism, it prevents fats buildup in liver, useful in intestinal disorders, anxiety, and depression.

**Main sources of threonine: -**

Cheese, chicken, fish, meat, lentil, black seed, nuts, soy etc.

**Basic clinical pharmacology of threonine: -**

It is useful in nervous system disorders, multiple sclerosis, spinal spasticity, makes bones, joints, tendons, ligament stronger, it helps the immune system, promotes heart health.

- **Isoleucine: -**

It is an amino acid that is used in the biosynthesis of proteins, it is an essential amino acid means the body cannot make it & we depend on food sources, it plays & helps many functions of the body.

**Main sources of isoleucine: -**

Meat, mutton, fish, cheese, egg, seeds, nuts, soybeans, milk, legumes, fenugreek seed etc.

**Basic pharmacokinetics of isoleucine (based on human intake in natural food products): -**

It is absorbed in small intestine by sodium-dependant active transport. It is metabolized in liver.

**Basic clinical pharmacology of isoleucine: -**

It promotes glucose consumption & uptake, it is anti-catabolic, enhances athletic performance & best for pre-workout, it acts on wound healing, detox of nitrogenous waste in the body, stimulates immune system, promotes secretion of many hormones, helps in hemoglobin formation, regulating blood glucose, energy in the body, built muscles, helpful to brain for its function.

- **Leucine: -**

It is branched chain amino acid (BCAA) it is ketogenic amino acid; it is necessary when we do exercise, it stimulates protein synthesis & assists in muscle building.

**Main sources of leucine: -**

Cheese, soybean, meat, nuts, chicken, seeds, fish, seafood, beans.

### **Basic clinical pharmacology of leucine: -**

It helps regulate blood glucose, promotes growth, recovers the muscles & bone tissues, acts on production of growth hormones, repairs the tissues, essential for muscle building, it burns fats, controls obesity, promotes lean muscles growth.

- **Lysine: -**

It is an essential amino acid, which our body cannot prepare and we need to eat it from food sources. It is necessary for many body functions, acts in building blocks of protein (muscles).

### **Main sources of lysine: -**

Red meat, chicken, egg, fish, beans, lentils, wheat germ, nuts, soybeans, spirulina, fenugreek seed, shrimp, pumpkin seed, tuna, cheese, milk etc.

### **Basic pharmacokinetics of lysine (based on human intake in natural food products): -**

It is absorbed from the lumen of the small intestine into the enterocytes by active transport, it undergoes first pass metabolism in liver & is metabolized in liver.

### **Basic clinical pharmacology of lysine: -**

It helps the body in tissue growth, repair muscles injury, promote collagen formation, help the body to produce enzymes, antibodies, hormones, supports immune system, its deficiency causes fatigue, irritability, nausea, hair loss, anorexia, inhibited growth, anemia, problems with reproductive system, it is very helpful in treating cold sores (herpes), control blood pressure, diabetes, osteoporosis, helps athletes performance, helpful in treating cancers, reduces anxiety, increase absorption of calcium, improves digestion & prevent leaky gut, helpful in pancreatitis.

- **Methionine: -**

It is a sulfur containing amino acid; it is essential; it plays a critical role in the metabolism & health; it acts on normal cell functioning, growth & repair. It is also a chelating agent for heavy metals; due to its sulfur content it is helpful in hair, nail health & growth & good for skin health; it reduces cholesterol by increasing the production of lecithin in liver & reduces fat formation in liver, also protects kidneys, liver from hepatotoxins, it is an antioxidant. It is absorbed in lumen of small intestines into enterocytes by active transport & metabolized in liver.

### **Main sources of methionine: -**

Meat, mutton, fish, chicken, cheese, egg, beans, milk, nuts, shellfish etc.

- **Cystine: -**

It is the oxidized dimer form of amino acid, it is nonessential; the body uses it to produce taurine & other amino acids; it is a sulfur containing amino acid; our body uses vitamin B6 with the help of cystine; it heals burns, wounds, bronchitis, assists in supply of insulin, it increases level of glutathione in liver, lungs, kidneys & bone marrow. It is anti aging, anti inflammatory, anti arthritis, anti rheumatoid arthritis.

### **Main sources of cystine: -**

Meat, egg, milk, garlic, onion, broccoli, oats, wheat germ, lentils etc.

- **Phenylalanine: -**

It is an aromatic essential amino acid in human; it plays a key role in biosynthesis of other amino acids; it is important in the structure & function of many proteins & enzymes. It is precursor of melanin, dopamine, noradrenalin hormone, thyroxine hormone. It is converted to tyrosine & used in biosynthesis of dopamine & noradrenalin. It improves memory, reduces pain of hunger; it is anti depressant; it is also a building block protein; it is useful in vitiligo, depression, ADHD, parkinson's, multiple sclerosis, pain, osteoarthritis, rheumatoid arthritis, fat burn & helpful in alcohol withdrawal symptoms.

### **Main sources of phenylalanine: -**

Pumpkin seed, nuts, seeds, soy, meat, fish, chicken, egg, beans, milk etc.

- **Tyrosine: -**

It is a nonessential amino acid; it is also called as 4-hydroxyphenylalanine; it is useful in cell synthesis of protein; it is a building block protein; body prepares it from phenylalanine. It is a precursor & used to produce noradrenalin, dopamine, & thyroxine & melanin hormones. It reduces stress, improves memory, it promotes growth, mental health, skin health, fat burn. It acts as a mood elevator, anti depressant, improves memory, mental alertness, its deficiency can cause hypothyroidism leading to low blood pressure, low body temperature (hypothermia), stress, fatigue, narcolepsy; it helps thyroid gland, adrenal gland, pituitary gland to function properly. It is absorbed in small intestine by sodium-dependant active transport; after absorption it reaches the blood & crosses the blood brain barrier (BBB) & enters the brain cells & gets metabolized into catecholamine (noradrenalin). Human body regulates its amount by eating it by food sources & making inside the body (nonessential). The body does not store it much for later uses.

**Main sources of tyrosine: -**

Meat, fish, egg, milk, nuts, beans, oats, wheat, black seeds etc.

**Dopamine: -**

It regulates reward & pleasure centers in brain; it is a chemical important for memory, motor skills & etc.

**Nor-adrenaline & adrenaline: -**

These hormones are responsible for fight & flight response in stressful situation & also controls many functions of the body; it is secreted by adrenal glands.

**Thyroxine: -**

It is secreted by thyroid gland; it regulates metabolism, blood pressure, digestion, energy etc.

**Melanin: -**

It is pigmented hormone, gives our skin, hair, eye their colour; dark skinned people have more melanin in their skin than light skin people (depend on exposure to sunlight).

- **Valine: -**

It is an essential nutrient for vertebrates, biosynthesis of protein; it is an aliphatic & extremely hydrophobic essential amino acid; it is branched chain of amino acid (BCAA); it is important for growth, repair, blood glucose regulation, for energy; it stimulates CNS, proper mental function.

**Main sources of valine: -**

Cheese, soy, beans, nuts, fish, meat, chicken, mushroom, seeds, nuts, whole grains etc.

- **Histidine: -**

It is an amino acid used in biosynthesis of protein; it is semi essential amino acid, needed by human for production of histamine & also for growth & tissue repair, it is helpful in maintaining myelin sheaths that covers the nerves & protects the nerves.

**Main sources of histidine: -**

Meat, mutton, fish, milk, egg, seeds, nuts, chicken, cheese, soy, beans, whole grains, fenugreek seeds.

**Basic pharmacokinetics of histidine (based on human intake in natural food products): -**

It is absorbed in small intestine via active transport requiring the presence of sodium.

**Basic clinical pharmacology of histidine: -**

It plays many roles in immunity, gastric secretion & sexual functions. It is also required for blood cell formation & protects tissues against damage of radiation & heavy metals. It keeps normal pH of 7 in the body, useful in rheumatoid arthritis, allergy, ulcer & anemia caused by kidney failure or dialysis. It is an antioxidant, anti inflammatory, reduces cholesterol.

- **Arginine: -**

It is among conditional essential amino acid the body needs to function properly; it is made in liver; it plays an important role in building protein thus helpful in body building.

**Main sources of arginine: -**



Chicken, pumpkin seeds, spirulina, dairy products, red meat, fish, egg etc.

**Basic pharmacokinetics of arginine (based on human intake in natural food products): -**

It is absorbed in jejunum mainly from oral diet.

**Basic clinical pharmacology of arginine: -**

It releases nitric oxide in the blood & nitric oxide dilates the blood vessels thus increases the blood supply & controls high blood pressure, it improves erection, builds muscles etc. it also act on release of growth hormone, insulin & other substances in the body. It also improves heart health, athletes performance, stimulates immune system; citrulline present in watermelon is converted into arginine in kidneys, please refer lesson on watermelon.

- **Alanine: -**

It is a non essential amino acids that is present in blood plasma in its free state in high levels; it is involved in sugar & acid metabolism, protein synthesis, it increases immunity, provides energy for muscles tissues, brain & CNS, it act on tryptophan, vitamin B6 metabolism; it is an important sources of energy for muscles; it helps the body to convert simple sugar (glucose) into energy; it is produced in the body. It increases exercise capacity; reduces muscle fatigue, boost immunity, it is antioxidant; anti aging; increases muscle growth; ideal pre & post workout, reduce blood sugar, prevent liver disease, helps the liver to eliminate toxins, improves CNS functioning, helpful in benign prostate hypertrophy. It is digested in small intestine; it is converted into pyruvic acid by alanine aminotransferase-1; during fasting condition alanine derived from protein breakdown is converted into pyruvate & used to synthesis glucose by gluconeogenesis in liver, it is excreted in urine via urea cycle. It is stored little in skeletal muscles.

**Main sources of alanine: -**

Meat, fish, egg, milk, aleovera, honey, black seeds, nuts etc.

- **Aspartic acid: -**

It is a non essential amino acid; it is over all negatively charged & plays an important role in synthesis of other amino acid, citric acid & urea cycles; it is found in animals, plants, sugarcane, sugarbeet. It may be a neurotransmitter; it strengthens the muscles, improves heart function, helps in maintaining mental health, reduces tiredness, improves athletic performance, increases muscle size, reduces depression & fatigue. It is absorbed in small intestine by active transport.

**Main sources of aspartic acid: -**

Meat, oysters, seeds, oats, avocado, sugar beet, milk, egg, nuts, cereals etc.

- **Glutamic acid: -**

It is a nonessential amino acid. It is an excitatory neuro-transmitter; it is necessary for biosynthesis of proteins; body uses it for several key functions within the body like making other neuro-transmitters such as GABA; it promotes brain health, muscles health, intelligence, mood & mental alertness. It is called as chemical messenger. It plays an important role in body's disposal of excessive waste like nitrogen. It is absorbed in lumen of small intestine into enterocytes by active transport & excreted in urine mainly. It is almost about 2 kgs, storage in natural form in brain, kidneys, liver, muscles etc.

**Main sources of glutamic acid: -**

Meat, chicken, fish, egg, milk, wheat, mushroom, soy, broccoli, walnut, peas etc.

- **Glycine: -**

It is a nonessential amino acid that body needs for growth & maintainance of tissue & need to prepare hormones & enzymes. It is inhibitory neurotransmitter. It helps in preparing glutathione (a powerful antioxidant & reduces free radicals, delay aging). It is helpful in preparing of creatine (provides energy to muscles to perform exercise etc & acts on muscle contraction), beneficial for brain health, bone health, alzheimer's, schizophrenia, sleep disorder, stroke, burns, protects kidney & liver from harmful side

effects of drugs used after organ transplant, heals wound & ulcers, it is anti inflammatory, improves skin health.

**Main sources of glycine: -**

Meat, fish, milk, legumes etc.

- **Proline: -**

It is a protein-genic amino acid used in biosynthesis of proteins. It heals cartilages, cushion joints, tendons, ligament, heart muscles, connective tissues & helps in formation of collagen.

**Main sources of proline: -**

Soy, pumpkin seed, lentils, black beans, quinoa etc.

- **Serine:-**

It is a nonessential amino acid, important for synthesis of protein, fats metabolism, muscle growth, immune system; it is a precursor of many amino acids, helpful in enzyme catalyze its reaction, overall health, physical & mental health.

**Main sources of serine: -**

Soybean, egg, lentils, meat, fish, nuts, almonds, walnut etc.

- **Asparagine: -**

It is a non essential amino acid; it acts on biosynthesis of proteins; it is a nontoxic carrier of residual ammonia to be eliminated from the body; it acts as diuretic also; it helps cell, nerve, brain to function. It is helpful to nervous system, reduces fatigue, helps in building muscles, improves liver function, protects liver, beneficial for nerve cells & brain; increases stamina, help in synthesis of various enzymes, proteins, glycoprotein etc.

- **Main sources of asparagine: -**

Milk, meat, egg, fish, soy, potato, legumes, nuts, seeds etc.

- **Other contents of guggul, myrrh & benzoic: -**

- **Pinene**

It is a bicyclic monoterpene chemical compound. There are two structural isomers of pinene found in nature:  $\alpha$ -pinene and  $\beta$ -pinene. As the name suggests, both forms are important constituents of pine resin; they are also found in the resins of many other conifers, pine tree, maktur tree oil, lime fruit peel, as well as in non-coniferous plants such as camphorweed (*Heterotheca*) and big sagebrush (*Artemisia tridentata*). It is anti-inflammatory, bronchodilator, antianxiety, anti-pain etc.

- **Limonene: -**

It is a cyclic monoterpene & is the major component in the oil of citrus fruit peels; it is soluble in water; it has a pleasant aroma.

**Main sources of limonene: -**

It is present in orange, orange peel, grapes, lemon, lime, mandarins & marjoram.

**Basic pharmacokinetics of limonene (based on human intake in natural food products): -**

Limonene is completely absorbed when taken orally; it can be absorbed by inhalation up to 70%; it can be also absorbed by skin; it is distributed throughout the body & fats tissues; it is metabolized in liver & excreted in urine.

**Basic clinical pharmacology of limonene: -**

it is anti-inflammatory, antioxidant, anti-stress, prevents diseases, it is a natural insect repellent, it is used as an additive & flavouring agent, it is used in shampoo, soaps, perfumes detergent making, also used in laundry, cosmetics, air fresher etc. It is also available in concentrated supplement in capsules & liquid form; it is anti-inflammatory, antioxidant, anti-cancer, heals heart disease, strengthens the heart, reduces stress, anxiety and improves digestion.

- **Eugenol:-**

It is member of allybenzene class compound. It is colourless or pale yellow aromatic oily liquid extracted from many essential oil like cinnamon, clove oil, nutmeg, basil, bay leaf, marjoram, clove-bud oil, clove leave oil. It has

pleasant, spicy, clove like aroma. It is used in perfumes & flavorings; it is antiseptic, anaesthetic, reduces pain & induces sleep.

- **Acetic acid, formic acid: -**

These acids are present naturally in all types of honey & it prevents honey bee colony (hive) from many mites infection like Varroa jacobsoni, one of the most common and dangerous mites in colonies of honey bee and can cause the death of untreated bee hives in a few years. They have anti bacterial, anti viral & antifungal properties. Succinic acid is a dicarboxylic acid with the chemical formula  $(CH_2)_2(CO_2H)_2$ . The name derives from Latin succinum, meaning amber.

- **Palmitic acid: -**

It makes up 7% to 13% of extra virgin olive oil; it is a common saturated fatty acid; it is the first fatty acid produced during lipogenesis (fatty acid synthesis) & from which longer fatty acids can be produced.

**Main sources of palmitic acid: -**

It is present in olive oil, flaxseed oil, soyabean oil, sunflower oil, palm oil, cocoa butter, meat, milk & etc.

**Basic pharmacokinetics of palmitic acid (based on human intake in natural food products): -**

Its absorption, metabolism & excretion are under research.

**Basic clinical pharmacology of palmitic acid: -**

It softens the skin & keeps it moist thus good for psoriasis & eczema. It coats the skin, it is powerful anti-oxidant; it maintains the health of hair & skin from aging, cleans them from dirt, sweat, excessive sebum (main cause of acne and boil on face & other parts of the body).

- **Tannin: -**

It is of astringent (dry & puckery feeling in mouth) taste, it is a polyphenol present in many plants, fruits, plant's wood, bark, leaves, skin, seeds etc. It is also called as Tannic acid; it is of 2 types hydrolysable & condensed. Hydrolysable is decomposable in water & reacts with water & form other substance. Condensed form is insoluble & precipitates, it is called as tanner's reds. But most of tannic acid is water soluble.

**Main sources of tannin: -**

It is present berries, apple, barley, nut, tea, legumes, grapes, pomegranate, quince, oak wood, lemons, squash etc.

**Basic pharmacokinetics of tannin (based on human intake in natural food products): -**

Its absorption, metabolism & excretion are yet not known & are under research. After ingestion its bioavailability is poor due to its large size, high affinity to bound to plasma protein & low lipid solubility. It gets hydrolyzed in glucose & release gallic acid & other compounds upon decomposition.

**Basic clinical pharmacology of tannin: -**

It is used internally & externally. Externally it cures & heals the condition when applied on cold sores, fever blisters, diaper rashes, bleeding gums, tonsillitis, skin rashes, white discharge, yellow discharge, minor burn etc. It is used as douche for vaginal disorders like white or yellow discharge.

In food it is used as flavoring agent & naturally present in fruits etc, it relieves & cures chronic diarrhea, dysentery, hematuria (blood in urine), pain in joints, persist cold, cancers etc, it reduces high blood pressure, high lipids in blood. It is anti aging, anti oxidant, anti bacterial, anti enzymatic. It is used in medicated ointments for piles.

If used excessive it can give toxic effects on skin & internally may reduce absorption of vitamin, cause stomach irritation, nausea, vomiting, liver damage, kidney damage. It should not be used in pregnancy, breast feeding & constipation.

- **Protocatechuic acid: -**

It is a dihydroxybenzoic acid (a type of phenolic acid); it is structurally similar to gallic acid, caffeic acid, vanillic acid & syringic acid; it well known antioxidant, anti-inflammatory, anti bacterial, anticancer, anti ulcer, anti-ageing, antiviral, analgesic, protects liver, heart, brain & nerves; it is mainly present in green tea, bran & grains, almond, olive oil, star anise, plums, rosemary, Japanese ginkgo biloba.

- **Myrcene: -**

It is monoterpene & is olefinic natural organic hydrocarbon; its aroma is earthy, fruity & clove like; it is pungent, it synergizes activity of terpenes & it has a role as a plant metabolite etc.

It is present in wild thyme leaves, cannabis, hops, lemon grass, mango, myrica, verbena, cardamom, West Indian bay tree, marjoram, houttuynia, basil etc.

It is useful in treating diabetes, diarrhea, dysentery, blood pressure, reduces pain, increases transdermal absorption, improves glucose tolerance, good for osteoarthritis, also used as flavouring agent, perfume making etc; it crosses blood brain barrier & increases the transport of cannabinoids in the brain, ), it is a significant analgesic. It is under research & its absorption, metabolism is not known. It is anti anxiety, anti depressant, sedative, anti inflammatory, anti epileptic, increase immunity.

- **Limonene: -**

It is a cyclic monoterpene & is the major component in the oil of citrus fruit peels; it is soluble in water; it has a pleasant aroma.

**Main sources of limonene: -**

It is present in orange, orange peel, grapes, lemon, lime, mandarins & marjoram.

**Basic pharmacokinetics of limonene (based on human intake in natural food products): -**

Limonene is completely absorbed when taken orally; it can be absorbed by inhalation up to 70%; it can be also absorbed by skin; it is distributed throughout the body & fats tissues; it is metabolized in liver & excreted in urine.

**Basic clinical pharmacology of limonene: -**

it is anti-inflammatory, antioxidant, anti-stress, prevents diseases, it is a natural insect repellent, it is used as an additive & flavouring agent, it is used in shampoo, soaps, perfumes detergent making, also used in laundry, cosmetics, air fresher etc. It is also available in concentrated supplement in capsules & liquid form; it is anti-inflammatory, antioxidant, anti-cancer, heals heart disease, strengthens the heart, reduces stress, anxiety and improves digestion.

- **Triterpenes: -**

It is a natural group of plant product (saponins); it is of two types simple & complex, simple are components of surface waxes & specialized membranes & act as signaling molecules; complex are glycosylated & provide protection to the plant against pathogen & pests.

**Main sources of Triterpenes: -**

Olive oil, olive leaves, olive fruits, rosemary, cucumber, it is present in plant surface such as stem bark, leaf, fruit waxes of many plants specially of Lamiaceae family.

**Basic pharmacokinetics of Triterpenes (based on human intake in natural food products): -**

Before absorption it is hydrolyzed by intestinal enzymes or by bacterial enzymes in large intestine and absorbed; it has low absorption rate; not much is known about its digestion.

**Basic clinical pharmacology of Triterpenes: -**

It is anti tumour, anti viral, anti bacterial, anti oxidant, anti diabetes, cardio protective, anti obesity, anti cancer, anti ulcer, anti inflammatory, immune-modulator, resolve immune diseases.

- **Ferulic acid: -**

It is a hydroxycinnamic acid, an organic phenolic compound; it is antioxidant & used in skin care products, it reduces spots, wrinkles, it is anti-ageing, anti hypertensive, anti diabetic, helpful in cardiovascular diseases, Alzheimer's etc. It is mainly present in bran, oats, rice, eggplant, citrus, apple seeds etc.

- **Linalool: -**

It refers to 2 enantiomers (opposite or mirror image) of naturally occurring mono-terpene found in flowers & plants of many spices; it has a role plant metabolite, a volatile oil component, an anti microbial agent, a fragrance agent, it is present in sweet basil, lavender, laurel, citrus fruits, cinnamon, rosewood, birch tree, tea tree oil etc. It is anti anxiety, anti depressant, sedative, anti inflammatory, anti epileptic, increase immunity. It is under research & its absorption, metabolism is not known.

- **Terpineol: -**

It is a monoterpene alcohol that is isolated from a variety of sources like pine oil, petit-grain oil, marjoram oil, cajuput oil. Alpha terpineol is most commonly present in trees, though there are 5 isomers of it, Alpha, beta, gamma, delta & terpinen-4-ol; it has pleasant odour & commonly used in perfumes,

cosmetics, aromatics, scents etc; It is antioxidant, anticancer, anti-convulsant, anti-hypertensive, anti-nociceptive; it enhances skin penetration, it is insecticidal; it is also present in flowers, of narcissus, & freesia, & in herbs like marjoram, oregano, rosemary, lemon peel oil.

- **Geraniol: -**

It is a mono-terpene found in many essential oils of fruits & vegetables, herbs like rose oil, citronella, lemon grass, lavender, thyme oil etc. it is emitted from flowers of many spices of plants & used in food, fragrance & cosmetic products; it is microbial, anti inflammatory, antioxidant, anti cancer, neuro-protective, anti cancer, anti tumour. It is colourless or little yellowish, slightly water soluble & has a sweet odour rose oil like; its absorption, metabolism is not known.

- **Lignans: -**

It is among polyphenols, it is rich in omega 3 fatty acid (alpha linolenic acid). It has estrogenic activity in the process digestion, bacterias convert lignans into estrogenic like substance.

**Main sources of lignans: -**

It is present in cucumber, flax seeds, sesame seeds, cereals, soybean, broccoli, cabbage, apricot, strawberries.

**Basic pharmacokinetics of lignans (based on human intake in natural food products): -**

Its absorption, metabolism & excretion are yet not known & are under research.

**Basic clinical pharmacology of lignans: -**

It increases digestion, reduces high blood pressure, cholesterol, blood glucose; it is anti cancer, anti inflammatory, anti oxidant.

- **Cineole: -**

It is mono-terpene ether present in essential oils & used in fragrance, flavoring, medicines, cough drops, personal care products, used as expectorant, anti septic. It is main constituent of eucalyptus oil; it is colourless, oil, slightly soluble in water. It has camphor like odour & pungent spicy cooling taste; it is also called as eucalyptol; it is anti inflammatory, anti viral, antioxidant, anti spasmodic, increase cerebral blood flow, anti fugal, immune-regulator, helpful in sinusitis, asthma, acute & chronic bronchitis, sore throat, laryngitis, herpes simplex, acne, measles, chicken pox, ulcers, wounds, boils cuts, burns; it is mucolytic, analgesic, clears the airway. It is present in sweet basil oil, common sage, bay leaves, camphor laurel, tea tree, worm-hood, mugwort, rosemary, thyme oil, cannabis sativa. Its absorption & metabolism is not known.

- **Potassium: -**

It is a mineral with symbol K & atomic number 19, it is an essential mineral which body cannot prepare; it is necessary for heart, kidney & other organs to function, its low level in body is called as hypokalemia & high level is called as hyperkalemia; it is mostly present inside the cells (intracellular); normal blood range is 3.5 to 5.0 milli equivalents per/liter (mEq/L).

**Main sources of potassium: -**

Potassium is naturally present in banana, orange, dates, raisin, broccoli, milk, chicken, sweet potato, pumpkin, spinach, watermelon, coconut water, white & black beans, potato, dried apricot, beetroot, pomegranate, almond, quince etc.

**Basic pharmacokinetics of potassium (bases on human intake in natural food products): -**

It is absorbed in small intestines by passive diffusion; it is stored mostly inside the cell, little in liver, bones & red blood cells. 80 to 90% potassium is excreted in urine & 5 to 20% is excreted in stools, sweat.

**Basic clinical pharmacology of potassium: -**

It is a mineral belongs to electrolytes of the body; it conducts electrical impulses throughout the body & assists blood pressure, normal water balance, muscle contraction, nerves impulse, digestion, heart rhythm, maintain pH balance. It is not produced in our body so we need to consume it through eating; Kidneys maintain normal level of it in the body by excreting excessive amount of it in urine or reabsorb it if the amount is less in the body so that the body may reuse it. Its deficiency may cause weakness, low blood pressure, constipation, nausea, vomiting etc. Its normal amount in body keeps blood pressure normal; water balance in body normal; prevents heart disease, stroke, osteoporosis, kidney stone etc.

- **Carbohydrate: -**



It is a macronutrient needed by the body, the body receives 4 calories per 1 gram of it; carbohydrates includes sugar, glycogen, starch, dextrin, fibre & cellulose that contain only oxygen, carbon & hydrogen. It is classified in simple & complex; simple carbs are sugar & complex carbs are fibre & starch which take longer to digest. It is basic source of energy for our body.

**Main sources of carbohydrates: -**

It is present in watermelon (little), potato, sweet potato, bread, oats, butter, white rice, whole grain rice, pasta, lentils, banana, pineapple, quince etc.

**Basic pharmacokinetic of carbohydrate (based on human intake in natural food products): -**

Its digestion begins in mouth; salivary glands releases saliva & salivary amylase (enzyme) which begins the process of breaking down the polysaccharides (carbohydrates) while chewing the food; now the chewed food bolus is passed in stomach through food pipe (esophagus); gastric juice like HCL, rennin etc & eaten material are churned to form chyme in the stomach; the chyme now is passed little by little down into duodenum, pancreatic amylase are released which break the polysaccharides down into disaccharide (chain of only sugars linked together); now the chyme passes to small intestine, in it enzymes called lactase, sucrase, maltase etc breakdown disaccharides into monosaccharide (single sugar) & absorbed in upper & lower intestines, through villi present in small intestine & send into liver through venous blood present into portal veins, as per bodies need it is releases in the blood stream & pancreas release insulin to use it as source of energy for the body, & extra is stored is converted into glycogen by liver & stored in liver & little is stored in muscles & tissues. Liver can reconverts glycogen in to sources of energy if body lacks for other source of energy, the undigested carbohydrates reaches the large intestine (colon) where it is partly broken down & digested by intestinal bacterias, the remains is excreted in stools.

**Clinical pharmacology of carbohydrates: -**

Carbohydrates are main sources of body energy, it helps brain, kidney, heart, muscles, central nervous system to function, it also regulates blood glucose, it acts on uses of protein as energy, breakdown of fatty acids & prevent ketosis. If we eat less carbohydrate it may lead to hypoglycemia, ketosis, frequent urination, fatigue, dizziness, headache, constipation, bad breath, dehydration etc.

Excessive intake of carbohydrates may lead to vascular disease, atherosclerosis (leads to narrowing of arteries, stroke, diabetes, obesity, fatty liver, blood pressure etc.

- **d-Limonene: -**

It is a cyclic monoterpene & is the major component in the oil of citrus fruit peels; it is soluble in water; it has a pleasant aroma.

**Main sources of limonene: -**

It is present in orange, orange peel, grapes, lemon, lime, mandarins & marjoram.

**Basic pharmacokinetics of limonene (based on human intake in natural food products): -**

Limonene is completely absorbed when taken orally; it can be absorbed by inhalation up to 70%; it can be also absorbed by skin; it is distributed throughout the body & fats tissues; it is metabolized in liver & excreted in urine.

**Basic clinical pharmacology of limonene: -**

it is anti-inflammatory, antioxidant, anti-stress, prevents diseases, it is a natural insect repellent, it is used as an additive & flavouring agent, it is used in shampoo, soaps, perfumes detergent making, also used in laundry, cosmetics, air fresher etc. It is also available in concentrated supplement in capsules & liquid form; it is anti-inflammatory, antioxidant, anti-cancer, heals heart disease, strengthens the heart, reduces stress, anxiety and improves digestion.

- **Phellandrene: -**

In Marjoram alpha & beta phellandrene are present; it is a pair of organic compound that have a similar molecular structure & similar chemical properties; both alpha & beta are cyclic monoterpenes & are double-bond isomer. In alpha both double bond are endocyclic & in beta one double bond is exocyclic; both are soluble in water; they have a pleasant aroma & peppery taste.

Alpha is potential immune stimulator, anti-fungal, anti inflammatory, anti-cancer, anti pain, develop natural killer (NK) in the body, boost immune system; beta is anti microbial, anti-fungal, antioxidant; both are believed to be excreted in stools,

Beta is present in oil of following bitter fennel, elemi, ginger-grass, ridolfia segetum & alpha is present in oil of cinnamon, dill, turmeric, ceylon etc.

- **Dipentene: -**

Dipentene (also called D-Limonene), is a terpene liquid found in various volatile oils such as cardamon, mace, nutmeg, turpentine oil. Dipentene is mainly composed of Limonene, beta Phellandrene, Myrcene and other terpenes; it is used as a perfumery composition for soaps, personal care products and cosmetics; used as a gallstone solubilizer in pharmaceutical industry.

- **Cuminaldehyde**

Cuminaldehyde (4-isopropylbenzaldehyde) is a natural organic compound with the molecular formula  $C_{10}H_{12}O$ . It is a benzaldehyde with an isopropyl group substituted in the 4-position. It is a constituent of the essential oils of eucalyptus, myrrh, cassia, cumin, and others; it has a pleasant smell and contributes to the aroma of these oils. It is used commercially in perfumes and other cosmetics. It has been shown that cuminaldehyde, as a small molecule, inhibits the fibrillation of alpha-synuclein; which, if aggregated, forms insoluble fibrils in pathological conditions characterized by Lewy bodies, such as Parkinson's disease, dementia with Lewy bodies and multiple system atrophy.

- **Cinnamaldehyde: -**

Cinnamaldehyde is an organic compound; occurring naturally as predominantly the *trans* (*E*) isomer, it gives cinnamon its flavor and odour. It improves metabolism & is anti-obesity; it is helpful in Alzheimer's disease.

- **m-cresol: -**

It is also called as meta-Cresol & 3-methylphenol; it is an organic compound; it is a colourless, viscous liquid that is used as an intermediate in the production of other chemicals. It is a derivative of phenol and is an isomer of p-cresol and o-cresol. It gives creosote its antibacterial and insecticidal properties.

- **Heerabolene: -**

Heerabolene natural formula penetrates deep into the skin cells to provide intense nourishment for soft, supple and hydrated skin. Its regular use nourishes and protects skin from harsh weather conditions and helps heal cuts and cracks. Heerabolene is a safe emollient to use on any part of the body. It is used with aloe vera & vitamin E in making cosmetic creams.

- **Cadinene:-**

Cadinene is the trivial chemical that occurs in a wide variety of essential oil-producing plants. The name is derived from that of the Cade juniper (*Juniperus oxycedrus* L.), the wood of which yields oil from which cadinene isomers were first isolated. Chemically, the cadinenes are bicyclic sesquiterpenes. It is anti-inflammatory & increases energy level.

- **Amyrin: -**

Amyrins are three closely related natural chemical compounds of the triterpene class. They are designated  $\alpha$ -amyrin (ursane skeleton),  $\beta$ -amyrin (oleanane skeleton) and  $\delta$ -amyrin. Each is a pentacyclic triterpenol. They are widely distributed in nature and have been isolated from a variety of plant sources such as epicuticular wax. In plant biosynthesis,  $\alpha$ -amyrin is the precursor of ursolic acid and  $\beta$ -amyrin is the precursor of oleanolic acid. It is antinociceptive and anti-inflammatory.

- **Beta-eudesmol: -**

Beta-eudesmol is a carbobicyclic compound; it has a role as a volatile oil component; beta-Eudesmol found in *Atractylodes lancea* rhizome has a desensitizing channel blocking action to nicotinic acetylcholine receptors, anti-angiogenic action in vascular endothelium, and neuronal differentiation actions.

- **Curzerene: -**

Curzerene is a volatile, aromatic terpenoid found in many herbs and spices; it is also present in myrrh oil; it is anti-inflammatory.

- **Benzyl cinnamate**

Benzyl cinnamate is the chemical compound which is the ester derived from cinnamic acid; it has a nice aroma & it used in perfumes making.

- **Guggulsterone: -**

Guggulsterone is a phyto-steroid found in the resin of the guggul plant, *Commiphora mukul*. It exists as either of two stereoisomers, E-guggulsterone and Z-guggulsterone. In humans, it acts as an antagonist of the farnesoid X receptor, which was once believed to result in decreased cholesterol synthesis in the liver.

- **Cembrene A**

Cembrene A, or sometimes neocembrene, is a natural monocyclic diterpene isolated from corals of the genus *Nephthea*. It is a colour less oil with a faint wax-like odor.

**Please note explanations of many constituents are not written because no proper knowledge is available till date & research is on worldwide**

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- **Research on guggul: -**

**SCIENCE & HADEES REGARDING GUGGULU:-**

Guggulu has anti bacterial activity so helpful in urinary problems & it is mostly lipid soluble & helpful in weak memory. Modern medical investigations have shown that the gum-oleoresin & guggulu are beneficial in cases of rheumatoid arthritis, asthma, and ulcerative colitis with no side effects as & are drugs of choice. They improve blood supply to the joints and restore integrity of vessels weakened by spasm. According to a review of unpublished studies, preliminary double-blind trials have found loban & guggulu effective in relieving the symptoms of rheumatoid arthritis. Two placebo controlled studies, involving a total of 81 individuals with rheumatoid arthritis, reported significant reductions in swelling and pain over the course of 3 months. In one study conducted at the Government Medical College in Jammu, India, nearly 60 percent of arthritic patients tested experienced good to excellent results against stiffness and pain. Over three-quarters of the patients in the study were either bedridden or incapacitated from doing normal work. Within two to four weeks after starting on Guggulu extract, they reported a lessening of morning joint stiffness, pain, and improved grip strength. In another study of 26 patients suffering from arthritic knees, dramatic improvement was experienced within four weeks. A German review published in 2002 documents the effectiveness of boswellic acids (key active ingredient) in treating arthritis, chronic ulcerative colitis, Crohn's disease, bronchial asthma and reactive swelling around a brain tumour, as shown by clinical trials.

Experimental and clinical usage of loban & guggulu indicates that they have no of side effects on blood pressure, heart rate, gastric irritation and ulcers associated with many anti-inflammatory and anti-arthritic drugs. It is now an approved herbal medicine in India for use against osteoarthritis, rheumatoid arthritis, soft tissue rheumatism, low back pain, myositis and fibrositis.

Animal studies have suggested that both lower cholesterol and triglyceride levels in the blood. In other controlled human studies, it was shown to decrease the duration of bronchial asthma, possibly by blocking formation of the chemicals that cause the blood vessels to contract. Also has shown to be effective in epilepsy.

One rat study showed the Guggulsterone Z, at a dose of 10mg/kg bodyweight, increased iodine uptake and metabolic activity of the thyroid gland. The mechanisms of action of guggulsterone Z in this regard is unlike Thyroid-Stimulating Hormone and is not a pituitary mediated. It was shown (again, at 10mg/kg bodyweight) to increase serum T3 and T4 levels. (It should be noted that this dose is much higher than what is customarily used in herbal supplements).

**Thyroid and Metabolic Rate**

One rat study showed the Guggulsterone Z, at a dose of 10mg/kg bodyweight, increased iodine uptake and metabolic activity of the thyroid gland

**Cholesterol: -**

Guggulsterones have been noted to reduce hepatic (liver) cholesterol in mice via antagonism of the Farnesoid X (FXR) receptor when the cholesterol is introduced in the diet. The mechanism of action seems to be through decreasing bile acid secretion and synthesis (via inhibiting the rate limiting enzyme of bile acid synthesis from cholesterol.

**Cancer: -**

Through inhibition of P-glycoprotein efflux in breast cancer cells, guggulsterone have been implicated at increasing chemosensitivity to doxorubicin in drug-resistant breast cancer cells.

**Anti-Inflammatory effects: -**

Guggul is able to suppress the activation of NF-kB via interfering with various activators such as hydrogen peroxide, TNF-a, phorbol ester and cigarette smoke

- **CONCLUSION OF RESEARCH: -**

Use Guggul in urinary problems & weak memory, soak in little water overnight & drink the water in morning empty stomach. It has antiviral, anti bacterial, preventive, curative, healing, anti-obesity, anti thyroid diseases properties. It is easy available in India. It is good for heart & heart diseases. It is helpful in hypothyroidism, hyperlipidemia and obesity. Plants like guggul are the most incredible gift of our nature. And guggul means fight against diseases is true. From this review article, it is figured that Guggul is a plant of many bioactive constituents which are used for treating many diseases like rheumatoid arthritis cancer, antiinflammation, microbial infection, wound, cholesterol level, hypo-lipidemic, gastrointestinal problems and tumors .It is one the best and old traditional medicine . Many chemical constituents like steroids, sterons, flavonoids, tri terpenoids, amino acids, lignans, and Guggul tetrols are present in guggul. In this article it is clearly concluded that guggul means protection against many diseases. Beta sitosterol, Eugenol shows the high medicinal properties like anti-inflammatory, hypolipidemic, anti-cancer. Plants like guggul are the most incredible gift of our nature.

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### ● **Research: -**

#### **SCIENCE & HADEES REGARDING MUR: -**

It is anti bacterial, anti fungal, anti pest & etc, can be used for fumigation or oral uses. It has been used as an astringent, antiseptic, anti parasitic, anti tissive, emmenagogue, and antispasmodic agent. It was commonly included in mixtures used to treat worms, wounds, and sepsis. In Hadees it is mentioned to fumigate with it & it has been found that it is very helpful in fumigation.

#### **CONCLUSION OF RESEARCH: -**

1. Fumigate the houses with it along with Cress dried leaves, Saatar. It has anticancer, analgesic, curative, healing, anti-inflammatory, anti-bacterial, antifungal, anti-viral properties.

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